EPA Priority-Setting Workshop for the Endocrine Disruptor Screening Program

January 20-21, 1999
Crystal City Marriott, Arlington, VA

Meeting Summary

On Wednesday, January 20, 1999, the U.S. Environmental Protection Agency convened a two-day public workshop to discuss development of a priority- setting system for the selection of chemicals for screening tests in the Endocrine Disruptor Screening Program (EDSP). Approximately 20 invited individuals, representing non-governmental organizations, industry, state health agencies, EPA, and other federal agencies actively participated in the deliberations (see Attachment A). In addition, approximately 45 members of the public observed portions of the meeting at some point during the two days. The goal of the meeting was to present and receive comments on EPA's initial strawman proposal for a "compartment-based" approach to priority setting (see Attachment B). The meeting was facilitated by Tim Mealey, Meridian Institute, and Paul De Morgan, The Keystone Center.

Introduction

Gary Timm, a Senior Technical Advisor with EPA, opened the proceedings with a short review of the Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC) process and recommendations. Mr. Timm, who served as one of the lead EPA staff for the EDSTAC process, indicated one EDSTAC mission was to determine how to prioritize the range of chemicals for screening and testing. After examining a range of options, and the various levels of information available for different chemicals, the EDSTAC developed a compartment-based strategy that builds upon distinct exposure- and effects-related information categories and criteria as well as a category of specially-targeted chemicals. EPA accepted the EDSTAC's recommendation for a compartment-based priority-setting approach, however this approach really just provided a framework, or starting point, for the priority-setting process. EPA, following the framework and guiding principles recommended in the EDSTAC report, developed an initial "strawman" proposal for further defining and implementing a compartment-based system. In preparation for the meeting EPA distributed the strawman proposal which, in turn, was used as the vehicle to structure the agenda for most of the workshop.

Mr. Timm also indicated that the workshop was also partly a result of another of EDSTAC's recommendations, which called for EPA to continue to work with stakeholders in their efforts to develop and implement the program and to develop version two of the Endocrine Disruptor Priority Setting Database (EDPSD Version 2). EPA, he concluded, is working closely with the public on a number of implementation issues and is glad to have the opportunity to glean thoughts and advice from a broad range of stakeholders.

Opening Presentations

EPA staff made two presentations to set the stage for the discussions. It was noted that while some of the Workshop participants had been intimately involved in the EDSTAC process (as full members or work group members or both) and were therefore familiar with the materials, some had not participated in the EDSTAC effort and would likely benefit from an overview.

Background on the EDSP

Jim Darr, from EPA's Economics, Exposure and Technology Division, presented general information on the EDSP and key EDSTAC recommendations related to the program (see Attachment C). The major components of the program include: 1) sorting; 2) priority setting; 3) Tier 1 Screening; 4) Tier 2 Testing; and 5) hazard assessment. The presentation also included a figure, which schematically represented the flow of chemicals through the program. He indicated the EDSTAC recommended the program be transparent, rely heavily on empirical data, and, as mentioned above, utilize a compartment-based approach. The definition of "compartment" used in setting up the EDSP was as follows: "Set of chemicals defined by common features that allow ranking." As an example, he used the "environmental release" compartment which would consist of the set of chemicals with Toxics Releases Inventory (TRI) (or comparable) data. The major information categories in the approach were exposure data, effects data, integrated exposure and effects data, and specially-targeted chemicals (e.g., mixtures). Compartments would ostensibly be found within each of these categories. Mr. Darr ended his presentation with a brief discussion of the high throughput pre-screening process, which, after being validated, is intended to provide information to be utilized in the priority-setting program.

EPA's Strawman Approach

Pat Kennedy, also with EPA's Economics, Exposure and Technology Division, introduced the strawman proposal developed by a group of EPA staff based upon the EDSTAC's recommended framework. (The slides used by Mr. Kennedy can be found in Attachment D and, as mentioned earlier, the strawman proposal can be found in Attachment B).

He stated that EPA had accepted EDSTAC's recommendation to use a "compartment-based" approach to priority setting. He noted the EDSTAC final report included a conceptual framework for such an approach, and used examples of what might be included in a compartment, but did not recommend specific compartments. The EDSTAC framework, he explained, includes four distinct "categories" within which compartments can be defined and utilized for the purpose of priority setting. The categories include: 1) compartments defined by data related only to exposure; 2) compartments defined by data related only to effects; 3) compartments defined by integrating or combining exposure and effects data; and 4) specially-targeted chemicals.

With regard to the category of "specially-targeted chemicals," Mr. Kennedy noted the EDSTAC's recommendations were more detailed than with the other three categories. The EDSTAC recommended three distinct compartments within this category. These include: 1) chemicals identified through the EDSTAC recommended nominations process; 2) a specifically enumerated list of naturally-occurring non-steroidal estrogens (NONEs); and 3) a specifically enumerated and

limited list of chemical mixtures. He stated that the EPA strawman proposal fully incorporates this category, the three compartments within this category, and the more detailed EDSTAC recommendations for how to address each compartment. The strawman raises some questions, however, about how the compartments within the specially-targeted chemicals category should be handled in relation to the other three categories.

With regard to the other three categories, EPA staff, building upon the EDSTAC's recommendations, identified twelve exposure-only compartments and seven effects-only compartments. The strawman proposal did not concretely identify any compartments for the combined exposure and effects category.

Mr. Kennedy reiterated that the strawman proposal elaborated upon the EDSTAC's definition of a compartment to include "all chemicals within a compartment share the same feature(s) that define the compartment (e.g., chemicals with TRI release data). The defining feature(s) of the compartment should, if possible, be suitable for sorting chemicals within the compartment into a rank-ordered list." He explained the approach taken in the strawman would require relative weights to be assigned among the compartments and, eventually, knowledge of the total number of chemicals to be included in each phase of the program. He noted that the EDSTAC, in their report, felt the number of chemicals to be included in Phase I of the EDSP would affect decisions related to the preferred weighting procedure between these categories and the compartments within them. He stated that EPA welcomed comments on the proposed compartments, and the relative weights between compartments, but was not prepared to discuss the total number of chemicals to be included in each phase of the program.

During the remainder of the presentation, Mr. Kennedy identified a series of questions, raised initially in the Federal Register notice, he felt the group should be attempting to address during the deliberations. The questions were:

1) Do the exposure and effects compartments in the strawman proposal make sense? Are there other compartments that should be added? Should certain compartments be combined, and if so, which?
2) How should exposure and effects data be integrated, combined in the exposure/effects category?
3) How should each of the major information-related categories (i.e. Exposure, Effects, and Exposure and Effects) be weighted? If they are not weighted equally, how much weight should each receive?
4) How should the compartments within each information-related category be prioritized relative to each other? What factors should be considered and how should they be used?
5) Do the exposure compartments allow for adequate consideration of disproportionately exposed and susceptible populations? How can this best be done?
6) Should a fraction of the chemicals screened be given priority status based solely on ecological concerns (as opposed to human health concerns)?
7) How should chemicals that occur in multiple compartments be treated, i.e. should the ranking system somehow take into account frequency of occurrence across all compartments?
8) Should the specially targeted priorities, i.e. nominations, mixtures, and NONES, be included in the priority-setting system or should they be handled outside of the system?

9) What are the best data sources for the priority-setting system in terms of accessibility, reliability, and format?

The group agreed to revisit these questions at the end of the second day to ascertain whether they had adequately been addressed or at least discussed. He closed by noting EPA would welcome written comments, over the next 30 days, on any or all aspects of the strawman proposal, the questions, or the ensuing deliberations. Some workshop members had already submitted a few comments on the first draft of the proposal and they were integrated into the version handed out at the meeting.

Review of the Proposed Meeting Agenda

Mr. Mealey indicated the meeting goal was not intended to be consensus, but rather an opportunity for participants to identify and suggest possible solutions to the difficult problems associated with implementing a priority-setting system. In addition, the participants were encouraged to submit written comments after the workshop, upon contemplation of the discussions that took place. Mr. Mealey noted that his, and Mr. De Morgan's, role was to assist the participants in moving through the extensive agenda, ensuring all participants were given an opportunity to comment on the priority-setting system. In addition, he indicated, they would be capturing the group's deliberations and preparing a meeting summary.

The agenda, it was noted, was designed to allow the workshop participants to methodically go through each proposed compartment, starting first with the exposure-driven compartments, turning during the morning of the second day to the effects-driven compartments, and concluding with as of yet unidentified combined exposure and effects compartments. After completion of the discussion of proposed compartments for each category, Mr. Mealey explained, time was set aside in the agenda to discuss the relative weights for the compartments contained in each category, and after discussion of all four categories, the agenda called for a discussion of how it all might be integrated into a coherent priority-setting system. Mr. Mealey noted that this step-by-step approach would likely prove to be frustrating for those participants whose minds immediately gravitate towards an integrative, holistic, systems approach. He asked the group to be patient with each other and allow the discussion to flow back and forth between the "lumpers" and the "splitters." It was also noted that the meeting would conclude by revisiting the questions presented by Mr. Kennedy.

Some participants, who had been involved in the EDSTAC process, questioned EPA about the priority setting database tool recommended in the EDSTAC report. EPA staff indicated the database is still being refined and, though it is not yet ready, it should be available this summer for trial runs.

One participant wondered whether the program includes "cutoffs" below which no chemicals would be included in the program. In response, EPA staff noted the EDSTAC included the concept of a phased approach to screening and testing in their recommendations, without providing specific recommendations on the number of phases or the specific number of chemicals to be screened within each phase. However, the EDSTAC also clearly stated in its final report that it did not believe it would be necessary nor appropriate for all of the approximately 60,000

chemicals that will be considered for Tier 1 Screening (T1S) after the initial sorting is done, to go through T1S. EPA staff stated this implied that there would indeed be "cutoffs" below which no chemicals would be included in the program. However, they believed it would probably not be possible or even necessary to identify what those cutoffs might be until after the completion, at the very least, of the first phase of the EDSP.

Exposure Data Compartments

The agenda called for the group to discuss ten of the twelve proposed Exposure Data Compartments. The agenda did not include time to discuss the proposed compartments on Environmental Releases and Production Volume because they were considered to be less controversial and more straightforward. Thus, the group discussed the proposed exposure-related compartments in the following order:

- Human Biological Monitoring Data
- Ecological Biological Monitoring Data
- Environmental Monitoring Data – Surface and Ground Water
- Environmental Monitoring – Indoor and Outdoor Air
- Environmental Monitoring – Sediments/Soil
- Persistence
- Bioaccumulation
- Chemicals in Food and Drinking Water
- Consumer and Cosmetic Products
- Occupational Exposure

Human Biological Monitoring Data

Definition: A participant began by asking whether EPA intends to include metabolites in the compartment. It was noted that many of the analytes were intended to be included as a link to the parent compound or the metabolites and so yes, they were to be included. A participant suggested EPA should combine metabolites with their parent compounds.

Data Sources: Looking at the three listed sources, a couple of participants wondered whether EPA will include only existing studies owned by the federal government or expand the sources to include literature studies of additional studies. EPA indicated they were intending to limit the effort to existing studies rather than doing literature studies, but defined "existing" as accessible and easy to integrate. Participants felt there should be an effort to examine literature studies otherwise the endeavor will only be looking "under the lamppost." While recognizing the tension between limited resources and amount of information needs to be balanced, participants did indicate there are four or five journals that could cover most of the spectrum and be very useful. Regarding the study design, a couple of participants noted how helpful targeted searches can be in identifying important sources of information. A specific suggestion was that EPA contact the National Center for Toxicological Research as they are near to concluding development of a large database of new information and studies.

Ranking Options: Related to options for ranking within a compartment, a participant suggested EPA consider combining ranking by frequency and ranking by concentration. Alternatively, it was suggested they could be two separate sub-compartments and then combined according to the relative weighting eventually determined. As the discussion of relative weighting proceeded, it was noted that, if one goal is to put more weight on biological data then the sampling design of the monitoring studies chosen to be included is important.

Ecological Biological Monitoring Data

Definition: A participant asked EPA what "sample matrices" meant? In response, EPA indicated they were really trying to say flora and fauna matrices but agreed they should clarify the language as it could be interpreted as an environmental medium. Also, it was suggested the "wide range of species" language should be clarified.

Data Sources: Participants wondered whether STORET, one of the databases listed, was useful information. EPA staff agreed with the assessment that the database includes a lot of information, however it is thought to take a lot of time and effort to obtain the information in a useful format. Not having enough "meta" data information was also raised as a negative associated with STORET. Though a participant added that while that may be true for the "old" STORET information, "new" STORET has a lot more of that type of information.

Another member noted it might be more important to use the National Water Quality Assessment (NAWQA) program that looks at various watersheds around the world for this compartment. EMAP was suggested as another possible source. It was noted that Barnett Ratner, of the US Geological Survey (USGS), has done a series of studies on fish-eating birds on the East Coast, which could be useful, and that other studies might exist that should be accessed if possible.

Ranking Options: Only one option had been laid out and participants wondered how the "frequency of appearance in biological tissues" would actually play out. EPA suggested one way could be along the lines of "the chemical was looked for and found X percent of the time" or you could say it was found in 3000 studies and have no denominator. Not having a denominator was thought to be a poorer approach since the information would be far less useful. In addition, others indicated concentration should be included in the assessment. Participants suggested it would be important to take regional differences and the question of thresholds into account when assessing the data, though others wondered whether thresholds would really offer much value. Again, participants indicated knowing the study design is important to really understanding the information.

Environmental Monitoring Data – Surface and Ground Water

Definition: It was suggested there are at least two ways of looking at this compartment including: the pervasiveness of chemicals found in surface or ground water across the U.S. versus the concentration of chemicals found in spills, discharges, or other incidents that lead to surface or ground water contamination. However, with different approaches and implications to each situation it becomes difficult to understand why a chemical found in either of these would be tested over any others. Some participants felt EPA needs to agree on their objective with this

compartment: should the compartment be directed toward broad exposures or toward special sub-populations? It was also suggested that differentiating between non-point and point sources could be useful and important.

Data Sources: The USGS database described here is a subset of the entire USGS database and there are a significant number of additional samples out there as well as meta data available. Some added that the meta data affects the frequency and concentration question and can show trends. A journal search for this compartment might even be more relevant; because, for instance, a lot of small-scale ground water data exists from the Superfund National Priority List Database.

Ranking Options: The frequency versus concentration issue was raised again. While some participants expressed a preference to use either the frequency option or the concentration option, one participant indicated he would hate to miss the case where one study was done in one place that could have caused EPA to miss a sub-population of concern. Another suggested that the two approaches might be combined in an algorithm that integrates frequency and concentration (e.g., frequency multiplied by the duration of the exposure by concentration). Such an effort could be done for various sub-populations (e.g., adolescent girls, pregnant mothers) to see if there are any big outliers. It was suggested one needs to know exposure for some chemicals, and might need to examine concentration for others. In other words, there may not be a need to exclude either approach but there would need to be a way to prioritize between the two. Other participants told EPA that, if the priority setting database were available before the next meeting, and some test cases were done, these two approaches could be compared. One participant indicated it is important to assess concentrations at some level but, given that there may not be a lot of precision in the available databases, and this is a priority setting exercise EPA should not get too focused on the exposure side of rank ordering, without assessing occurrence as well.

It was noted that in the first two compartments exposure in tissues was fairly clear; whereas here it is less so. It was suggested there may need to be some connection between these compartments. For example, it might be useful to use information from the persistence compartment to help rank order chemicals within these compartments.

Environmental Monitoring – Indoor and Outdoor Air

Definition: One of the concerns about this compartment was it was impossible to determine what is a "general" source. Most of these data are in essence "snapshots" and any decision about what data to use or not use is really "cherry picking." Determining how to address air-borne exposure over time is difficult (though it was acknowledged that one could say the same thing about the other compartments as well). On the other hand though, participants recognized there could be small or limited exposures with important implications that they would not want to miss. The group discussed whether to split apart indoor air from outdoor air as they seemed fairly different. As one member pointed out, the U.S. population spends 80 % of their time inside.

Data Sources: Regarding outdoor air, it was noted that there are several more general, broad studies. Specifically, there are fairly large-scale hazard databases such as Integrated Hazardous Air Pollutant Study that was prepared by the International Joint Commission, the "six city" study which included Phoenix, and the TRI. Regarding indoor air, there are some specific studies, and

it was suggested that separating indoor air and outdoor air may make sense because outdoor air is more regulated but exposure is much higher indoors.

Ranking Options: Ranking options, it was agreed, would be very difficult as the data are found in so many different ways.

Environmental Monitoring – Sediments/Soil

Definition: It was noted the overall priority setting effort is intended to balance issues related to both ecological and human exposures. One participant thought this compartment might be already subsumed in the biological monitoring compartment.

Data Sources: It was suggested that, in making any decisions with respect to the use of these data, a series of questions need to be asked, such as, is this type of soil going to provide any type of exposure? Where is this type of soil found?

Ranking Options: One participant noted that, for this compartment in particular, but in others as well, actual background levels exist and would have to be accounted for at some point. Another asked whether something as simple as a "Koc" model could be used.

Persistence

Definition: A question raised was whether human exposure should be separated from ecological exposure within this compartment and/or overall. Human and ecological media can be very different. For example, chemicals found in carpets are not persistent in the classic sense (i.e., in comparison to release outdoors) but they may be persistent enough to cause significant human exposure because of the media into which they are released and/or contained.

The question of this compartment's title was discussed. One participant suggested adding "overall" in front of persistence if the compartment is combined with fate and transport. It was alternatively suggested that "environmental fate" was a more appropriate title, especially if separating human and ecological. One participant suggested combining persistence and bioaccumulation with the environmental media compartments such as soil, air, and water. If EPA does decide to keep persistence, mobility, and bioaccumulation together (per the EDSTAC recommendations), they would need advice on how to rank order them in a combined compartment.

Data Sources: One advantage to keeping persistence separate is that it can be tied to some of the major databases such as the NAWQA database.

Ranking Options: It was suggested that, wherever possible, EPA should try to calculate persistence using lab data instead of using experimental models. While models are important in figuring out how a chemical will partition, it is important to remember that whenever possible using models with real data is better than using calculated data. If, in ranking, EPA is not worried about a clear distinction, then using models is fine, but one still needs to look at them intelligently. Another participant felt multi-media models (such as discussed in Option 1 in the Strawman) are

good and that "overall" persistence is a good characteristic to examine. Because of this, the first option for rank ordering laid out in the paper, should be used to establish whether a chemical is persistent in the environment. Most of the other participants favored Option 1 as well, adding that where a chemical is most likely to end up is most important.

Bioaccumulation Potential

Definition: One participant asked whether EPA really was only interested in lipophilicity ("K_{ow}")? EPA staff answered, yes, "K_{ow}" is in this compartment and "Koc" would be covered under the persistence compartment as well.

Data Sources: (No comments.)

Ranking Options: It was noted that biological concentration factors (BCFs) differ from biological accumulation factors (BAFs) at very high log K_{ow} values (e.g., > 5), especially if you're trying to compare one substance to another. Participants felt it is important, when trying to rank different substances, to compare apples to apples, and BCFs are better than BAFs for this purpose as they are more constant.

At the end of the discussion, some of the participants suggested the compartment be changed to "bioconcentration" potential rather than "bioaccumulation potential" as this title more clearly states what should be assessed.

Chemicals in Food and Drinking Water

Definition: EPA staff indicated exclusion of dietary nutritional supplements from the strawman was an oversight. The Agency does plan to abide by the EDSTAC's recommendations that these substances be included. However, they indicated there is not much data available on them, especially to use in rank ordering efforts. Several participants stressed they are very important, though no comprehensive or definitive list of supplements is thought to exist, and this lack should be addressed by EPA, somehow, as soon as possible. One participant stated that attempting to include nutritional supplements could really bog down the program. As a response, another participant suggested they be included in Phase II as opposed to Phase I to keep pressure on the manufacturers.

Other items it was suggested need to be included are animal pharmaceuticals because of their importance in human diets and to fresh water fish species; and phytoestrogens in infant foods. It was also noted that food packaging is considered part of this compartment as it is an indirect food additive.

After some discussion, the group agreed it might be appropriate for EPA to break out this compartment into four sub-compartments consisting of: food additives, food supplements, contaminants found in food, and contaminants found in drinking water.

Data Sources: (No comments.)

Ranking Options: A participant suggested integrating bioaccumulation into this compartment for the contaminants (not additives). Others agreed it made sense to account for bioaccumulation in combination with this compartment but exactly how to go about that was unclear.

Regarding systemic doses, it was suggested that while there will not be any direct human evidence, EPA will need to rely on animal data/models and apply the results to humans.

One participant felt, of the three ranking options, the first is best, the second without effects data is not very relevant, and the third is appropriate only if food consumption is being assessed. Another felt combining the first two was the way to approach the ranking as they could each be considered half of the equation. Regarding ranking option number three (i.e., by number of people exposed), it was posited you could do estimates based on the existing Food and Drug Administration (FDA) database.

Consumer and Cosmetic Products

Stanley Milstein, from the FDA's Office of Cosmetics and Colors, gave a few opening comments related to FDA's statutory authority regarding regulation of cosmetics (see Attachment E for a copy of his overhead slide).

Definition: (No comments.)

Data Sources: The California Air Resources Board was identified as a specific source of data for volatile organic compounds.

Ranking Options: Option one, related to frequency of use, will be very difficult to utilize as products change so quickly. FDA and EPA acknowledged this is a problem and went on to add that the Source Ranking Database (SRD) does not address this problem. Further, EPA is not sure how to deal with this problem especially given that the SRD is out of date for products that have come on the market in the last few years.

Occupational Exposure

Definition: A participant questioned whether the TLVs, PELs, and RELs, which are all limits (i.e., standards) for occupational exposure, are really measures of exposure, effects, or some hybrid of both. The answer, someone replied, depends on which occupational exposure standard you are talking about. Some of the data for setting these standards are derived from risk assessments, and the assumption with these is that the exposure limits are somehow tied to exposure, which may or may not really be true, as sometimes exposure limits are simply set at the known exposure levels.

The question of what to do, in general, with disproportionately exposed sub-populations was raised. It was suggested that aside from occupational exposures, this problem should be handled in the nominations process.

Data Sources and *Ranking Options*: If EPA suggests rank ordering occur by the highest PEL, REL, or TLV value, then they should not assume the highest values in each list will automatically have the highest exposures. This is true in some cases and not true in others. Another problem is that examining concentration alone, without information on effects, is not useful and you should look at frequency, number of workers exposed, or use production volume as a surrogate if the information is old. Other participants agreed that the proposed approach to rank ordering did not make sense. However, another participant did not agree with these comments, saying the ranking system discussed is okay since this compartment is within the exposure data category and not the effects data category. There was also a recommendation to look for relevant workplace exposure data (e.g., OSHA inspection data).

Relative Weights of Exposure Compartments

As indicated earlier, EPA staff took the conceptual framework of a compartment-based approach to priority setting that was recommended by the EDSTAC and played it out to what they believed are its logical conclusions. Specifically, the approach taken in the EPA strawman proposes a compartment-based approach that requires some form of rank ordering within the compartments and relative weighting among the various compartments. It leaves open the possibility of whether the relative weightings should start first with the percentage of chemicals to be drawn from each of the four major categories (i.e., exposure only, effects only, integrated exposure and effects, and specially-targeted chemicals) before addressing the relative weights of each compartment within its designated category, or vice versa.

The facilitator suggested that, given the discussions thus far, the group might want to discuss opportunities to combine, integrate, or expand the exposure-related compartments proposed in the strawman.

One participant began by suggesting there does not need to be a single ordinal ranking process for each compartment for a compartment-based approach to priority setting to be successful. It was suggested that it is possible to use a "categorical" approach to rank ordering within some compartments, rather than an "ordinal" ranking system (i.e., high, medium, low, as compared to 1, 2, 3, … n). He also said he did not see any problems with expanding the number of compartments. EPA staff added that they did not see an overall ranking at the end of the process, but rather a "selection" of chemicals.

In thinking about the full set of twelve exposure compartments contained in the EPA strawman, the participants concluded they were not all the same "type" of compartments. After some discussions, the group began to delineate among the twelve, eventually concluding that the first two compartments, Human Biological Monitoring Data and Ecological Biological Monitoring Data, are inherently more important than the others. The reason is that these compartments by definition show clear evidence of exposure to humans and other species. It was acknowledged, however, that the relatively small number of chemicals that will included in these compartments suffers from the lamp post problem (i.e., human and ecological monitoring efforts are typically designed to assess the existence and concentration of a pre-selected set of chemicals).

On the other extreme, the Environmental Releases compartment and, even more so, the Production and Import Volumes compartment, were considered to be the furthest away from "true" exposure. In other words, these compartments were seen as "surrogates" for true exposure. It was thought that some combination of these and/or compartments could be used to counter balance the lamp post problem.

In between these two extremes, there are a number of compartments that address various types of environmental media which, depending on how they are used, could give a greater or lesser degree of emphasis to human versus ecological exposures, or vice versa.

Finally, it was thought that the environmental fate and transport compartments, which included "Persistence" and "Bioaccumulation" in the EPA strawman, were neither indications of "true" exposure nor "surrogates" for true exposure. Rather, the information contained in these compartments was fundamentally about certain characteristics of chemicals that could affect the degree to which human or ecological exposures can or do occur. Another comment, which seemed to find general agreement, was that persistence and bioaccumulation are important factors in ranking chemicals in other compartments (e.g., environmental release) but should not be used alone (either separately or together) as the basis for a compartment.

The group also discussed the relative weights that should be given to human versus ecological exposure and agreed, consistent with the EDSTAC recommendations, that these two types of exposure should be treated equally. That is, preference should not be given to one type of exposure versus the other.

As this scenario began to form, participants reminded themselves, and EPA, that when setting priorities it is important not to forget the goal of "looking outside the lamp post." Utilizing human or ecological monitoring data by itself is clearly a lamp post approach. To go beyond the lamp post, EPA probably needs to use the environmental releases and/or production and import volumes compartments, perhaps rank ordered not only by volume, but also by environmental fate and transport characteristics. Ideally, it was noted, the weightings approach will ensure all of the chosen chemicals are not coming from "underneath the lamp post."

In addition, some participants began to discuss the idea of sequencing the priority- setting decisions (which they returned to later in the meeting). A sequential approach to decision-making would mean that any chemical going into the EDSP that is drawn from the "first" compartment would cause that chemical to be removed from consideration (i.e., removed from the rank ordered lists) in the other compartments.

As the group began to consider discussing specific numbers, it became apparent its practicality was limited given the uncertainty related to the resources available and the numbers of chemicals expected to move through each phase of the program, let alone Phase I. As some participants started to become frustrated, EPA staff reiterated that these discussions are extremely useful in determining how to set priorities, regardless of the lack of clarity about the actual number of chemicals to be screened in Phase I. While the participants agreed, they did reiterate these questions need to be answered to really move the process forward.

Public Comments

Terry O'Bryan, with EPA's Risk Assessment Division, asked the group a few questions including: What do you think about stand-alone categories? Where you might designate some as compartments that can stand alone and others that have to be envisioned in combination with other compartments?

The questions raised by Mr. O'Bryan resulted in a number of comments and some progress in delineation of the different categories. In a couple of the participants' comments it became apparent that the group was beginning to gravitate more and more to applying the fate and transport factors to help rank order chemicals in other compartments.

A general comment was made that it would be nice to keep the process transparent such that knowledge of which chemicals were data rich and which were data poor was available.

One participant raised a concern that the process should allow for the application of common sense as well as data. The example used was related to the consumer products compartment where it was suggested that it was common sense to screen chemicals contained in infant pacifiers even if there was not a lot of exposure data to support the idea.

Day Two – Thursday, January 21, 1999

As the second day of the workshop began, Jim Darr and Pat Kennedy were joined by three other EPA staff to assist in presenting the Effects Data aspects of the strawman proposal and answering questions as appropriate. These three were: John D. Walker, Director of the TSCA Interagency Committee, Terry O'Bryan and Jennifer Seed, both of the Risk Assessment Division.

Effects Compartments

John Walker started the session with a brief presentation on health effects and the work accomplished by the Priority-Setting Work Group (PSWG), of the EDSTAC, during their efforts to examine the effects side of priority setting. He noted that version 2 of the EDPSD, conceived by the PSWG, is in development and EPA intends to use it as an important tool in the priority-setting process. He produced a transparency (reproduced here) to better explain the sources and numbers of chemicals and structures included in the EDPSD version 1:

Table 1. Effects Databases Used in EDPSD Version 1

Database	*# Chemicals*	*# Structures*
RTECS® Reproductive Effects	4,886	1,995
TSCATS 8(e) RTOX HE	271	210
TSCATS 8(e) RTOX EE	10	4
PROP 65 Reproductive Effects	514	395
HQSARs	23,462	23,354

John explained that version 1 of the EDPSD v.1 was developed at the request of EDSTAC with limited resources and about a 6-week development time. Given those constraints, John described how he, Chris Waller and Stacie Kane had to construct effects databases for EDPSD v.1 using readily-available electronic sources of effects data that might relate to endocrine disruption. He noted that they chose readily-available electronic sources of reproductive effects data, recognizing that reproductive effects could be caused by an endocrine-disrupting mode of toxic action as well as other modes of toxic action. John explained how they constructed the Registry of Toxic Effects of Chemical Substances (RTECS®) Reproductive Effects database, the Toxic Substances Control Act (TSCA) Test Submissions (TSCATS) TSCA section 8(e) reproductive effects (RTOX) health effects (HE) database, the TSCATS 8(e) RTOX ecological effects (EE) database and the PROP 65 Reproductive Effects database and illustrated the number of chemicals associated with each database and the number of those chemicals for which there were chemical structures in EDPSD v. 1 (Table 1). He mentioned that the reproductive effects databases provided logical data (i.e., whether or not a chemical caused reproductive effects). John noted that in the rapid development of EDPSD v.1, it was recognized that some chemicals were in all the reproductive effects databases. John recommended that if these databases were used to provide quantitative data in version 2 of EDPSD, that quality control and quality assurances procedures be implemented to provide the most reliable reproductive effects data using databases that minimize redundancies.

Mr. Walker described the Hologram Quantitative Structure Activity Relationships (HQSARs) database, explained how it provided quantitative data, (i.e., numerical estimates of a chemical's potential to bind to an estrogen receptor), and illustrated the number of chemicals with the HQSARs database and the number of those chemicals for which there were chemical structures in EDPSD v. 1 (see Table 1 above).

As with the previous days' deliberations related to Exposure Data, EPA asked the group to focus on the definition of the compartment and the potential options for ranking within each compartment. And, again, as ideas for data sources arose, participants were asked to submit those in writing unless they pertained specifically to the definition and ranking discussions. Also, the participants, and members of the public, were reminded to submit written comments in response to EPA's strawman and the deliberations of the workshop participants. The group went through all seven Effects Data Compartments in the following order:

- Epidemiology and Clinical Data
- Reproductive and Developmental Toxicity
- Carcinogenicity
- Subchronic
- Ecotoxicity
- QSAR
- High Throughput Pre-screening (HTPS)

One participant raised the question of whether the priority- setting process should only consider effects data related to estrogen, androgen, and thyroid (EAT) effects, adding that, if the strawman

was going to be a stand-alone document, this issue needs to be clarified. One EPA staff responded by saying the priority setting might be looking for "any endocrine effects" even though the screening and testing will only be focused on EAT, but wondered what the group thought. Several participants felt, assuming there is no additional cost or time, for the purpose of priority setting the Agency should use data related to any and all possible endocrine effects, not just EAT; however, the question of what would be done with the information would be important to address before the data were gathered and utilized. Some felt it was really a feasibility question for the Agency to answer. Others expressed a strong view that they did not see the value of gathering more than EAT data if EPA is not going to evaluate more than EAT.

Epidemiology and Clinical Data

Definition: (No comments.)

Data Sources: The group spent some time discussing the IRIS database. In answer to one question, it was thought that IRIS is updated every quarter and includes the dates of when the information is entered. One of the EPA staff added that in talking about IRIS one should distinguish between the "old" IRIS and the "new" IRIS. A pilot project, concerning the "new" IRIS, has already been completed and the Agency is now committed to producing "new" assessments. These new assessments are going through an extensive peer review process, which is making them last between two and three years.

Ranking Options: (No comments.)

Reproductive and Developmental Toxicity

Definition: The discussion began with a participant indicating some skepticism for making this a compartment because if such information is available, the chemical would likely bypass T1S and go to Tier 2 Testing (T2T) or hazard assessment. Others felt that just because reproductive and developmental toxicity data exists for a chemical that should not automatically bypass T1S and go to T2T or hazard assessment.

Data Sources: Regarding other sources of information, the National Center for Toxicological Research is currently performing an extensive literature search related to uterine weight and vaginal cornification. They have found about 1,200 chemicals that have been tested with about 1,000 being inactive.

Ranking Options: The question of why one would rank according to a NOAEL rather than a LC50 or IC50 was raised and EPA indicated they would prefer to use a quantitative, peer-reviewed endpoint (e.g., IC50) but if it is not available then they would look to other quantitative data such as the NOAEL. It was suggested you could do an ordinal ranking given the IC50, NOAEL, or LOAEL information (whichever is available) and also do develop a "logical" yes/no ranking as well. One participant added that HTPS, where you are getting information about differing levels of transcriptional activation, is intended to help in the ranking process. Given that the various studies will have a range of different dosing regimes, a participant suggested a way to

recognize those differences should be built into the effort. In addition, mechanism of action also need to be considered in these decisions.

Carcinogenicity

Definition: To begin, it was noted that this compartment will consider mechanism of action. One participant suggested EPA specify which target organs are of particular interest in the definition.

Data Sources: (No comments.)

Ranking Options: The potential option listed implied a chemical gets "in" as a result of a logical yes/no decision. While the group recognized it would be easier to use positive/negative results, they also agreed it would be helpful to get more information involved (such as dose) as it would strengthen the rationale for ranking.

Participants wanted to know whether it was only those chemicals having potential mechanisms of endocrine action that are being considered. One participant recommended EPA be clearer about genotoxicity results. EPA indicated that, certainly if there are positive results then the chemical would be included. However, if there are positive genotox results, the chemical would still be in the compartment, but would be ranked lower (though this has not been completely addressed yet). Participants suggested EPA not separate the two, though one noted that, for steroids, it might be useful to have information on endocrine activity and genotoxicity.

Another participant recommended EPA be clear the compartment is dealing with lab animals. As a follow-on question, the participant wondered why EPA separated out carcinogenicity for animals and not for humans. EPA responded the decision was driven, in large part, by availability of data and that human carcinogenicity would be considered in the epidemiology compartment.

Subchronic Toxicity (repeated dose toxicity)

Definition: (No comments.)

Data Sources: (No comments.)

Ranking Options: (No comments.)

The only suggestion made was that the endocrine target tissues should be enumerated; especially the immune system. EPA indicated support for the advice.

Ecotoxicity

Definition: A number of participants wondered why the compartment was not demarcated more clearly (i.e., separating out avian, aquatic, amphibians, etc.). EPA indicated it was an oversight that should be addressed. Specific recommendations included splitting out taxa to include fish, terrestrial birds and mammals, and amphibians.

Data Sources: Regardless, it was suggested that for this category EPA should exploit literature searches in these categories as much as possible and look at natural population studies. Some also noted that SETAC has put together a huge review of various taxa that would be particularly important to tap into.

Ranking Options: EPA staff indicated the ranking of this compartment is ordinal, rather than a "logical" yes/no system, with more weight being given to field data.

Quantitative Structure Activity Relationships (QSARs)

Some participants expressed the view that if QSARs are to be used to set priorities for Phase I of the EDSP, a lot more validation work needs to be accomplished. In addition, some wondered if QSAR information was utilized, how would EPA intend to rank it. EPA responded that the answer was not clear yet but empirical data would be ranked higher than predictive data.

EPA also indicated they will probably divide this compartment into different QSARs for different endpoints/binding affinities (e.g., estrogen, androgen, and thyroid). A participant wondered whether the compartment includes Structure Activity Relationships (SAR) as well as QSARs. EPA responded that, as the compartment is currently defined, SARs would not be included, but if SARs were available it could get help get the process out from under the lamp post.

It was also noted that, as intended by the EDSTAC, this compartment will be used in combination with HTPS data as it becomes available. The QSAR model is a semi-empirical model and when combined with more empirical data (e.g., HTPS) the models can be improved. An EPA staff member noted that the phased approach is intended to include the notion of possibly using models more often, perhaps even to the degree of eliminating some or all of the assays in T1S depending on whether the models can be validated. Someone suggested EPA review proceedings from a recent "EMWAT" workshop regarding use of models as they move further on this compartment.

Some participants indicated there are really three relevant types of models: QSARs, chemometric models, and pharmacophore models. In addition, new software is quickly advancing the applicability and usefulness of these models. Some in the group suggested changing the compartment name to better reflect a range of "models" currently available (e.g., "Mathematical Models" or SARs). One participant noted the National Center for Toxicological Research is currently doing good work with models and cautioned EPA against waiting for HTPS data to try to make use of rapidly improving QSAR results.

High Throughput Pre-Screening (HTPS)

A participant clarified that the assays that will be used in the HTPS are not measuring receptor binding but rather a level of gene transcription that may be a result of receptor binding. In addition, HTPS assays will assess agonistic and antagonistic effects. Finally, someone noted that, for purposes of transparency, the HTPS also explores the chemicals with and without metabolic activation.

The idea of separate compartments for estrogen and androgen was raised and supported by some participants. Several participants indicated EPA will need to provide a careful explanation to the general public of the meaning of HTPS data. Other participants recommended EPA stay with the compartment as is, but just more clearly delineate among the different sub-compartments resulting from the HTPS data. They emphasized agreement regarding the need for "transparency" in the process, but reiterated a desire to limit the number of compartments to make the priority setting decisions easier.

Relative Weights of the Effects Compartments

The group spent a few minutes recapping their overarching sense of the proposed compartments in the Effects category. The first four compartments are human health related ones based on empirical data. While the ordinal versus logical ranking issue existing for all of these, no one suggested combining them or splitting them out into more compartments. Some participants did suggest the nature of the data should be considered in determining how to rank these compartments.

In discussing the proposed Ecotoxicity compartment, the group agreed that ecological effects should somehow be given equal priority to human health effects for the purpose of priority setting. In addition, several participants strongly encouraged EPA to split these out by species. Such a delineation was seen as helping with overall transparency and consideration of the balance between human and ecological effects. The split, it was suggested, could be either as sub-compartments within the existing compartment or as new compartments depending on how the system was ultimately designed.

With regard to the proposed HTPS and QSAR compartments, differing points of view were expressed about whether QSARs, or chemometric and pharmacophore models, will be sufficiently validated for use in setting priorities for screening in Phase I. Those who felt they would be, expressed the view that these three different types of models should be separated out into different compartments or subcompartments.

Many participants seemed to agree the HTPS compartment should be broken out into separate subcompartments for estrogen, androgen, and thyroid.

It was suggested there may be a similar set of distinctions that can be made in the effects category (as was made in the exposure category) regarding the nature of the data and the extent to which it shows evidence of a true "effect," rather than being a surrogate for, or indicator of, possible effects. In addition, in order to keep human health and ecological effects on roughly equal footing, it was thought that human epidemiology studies and ecological field studies come closest to showing evidence of a true effect (similar to human and ecological sampling showing evidence of a true exposure). However, just as with the exposure category, the data drawn from these compartments suffers from the "looking under the lamp post" problem. The next step down from a true effect would be laboratory studies that address both human and ecological (i.e., species other than humans) effects. The next step down from that might be the HTPS results. And, finally, the fourth and final step down from evidence of a "true" effect, would be the various types of models outlined above. Some members of the group stated it would be necessary to use

combinations of data along this spectrum in order to balance the need to screen chemicals where there is at least some evidence of an effect, while still giving priority to chemicals that are outside the lamp post.

Several participants, who had been members of the EDSTAC pointed out that very little useful endocrine effects-related data exist on most chemicals, and the data that do exist, are not easily utilized for the purpose of priority setting. It is for this reason the EDSTAC recommended the use of HTPS – as a means of generating at least some effects-related data that could be used in purpose of priority setting.

Specially Targeted Chemicals

As noted earlier, the EDSTAC had very precise recommendations intended to cover important areas that might not be dealt with through the rest of the priority-setting process. EPA accepted the recommendations and included three specific categories: nominations, NONE's, and mixtures. The participants agreed with EPA's decision to accept the recommendations.

Combined Exposure and Effects Compartments

The facilitator initiated discussion of the combined exposure and effects compartments by pointing out that the idea for using a compartment-based approach grew out of the struggles of the EDSTAC's PSWG efforts to address the question of how to combine exposure and effects information. In other words, the PSWG went though a process whereby they identified the types of information they believed might be useful in setting priorities. In struggling with the question of how to actually use the information for this purpose, and especially the complex question of how to use exposure and effects information together, they come up with the idea of "compartments."

The facilitator went on to say the implication of the PSWG's intellectual process was that they gave a great deal of emphasis to the combination of exposure and effects information. He pointed to pages 4-73 in the EDSTAC Report to show that in the example used to describe the compartment-based approach, the EDSTAC indicated somewhere between 60% and 72% of the chemicals to be screened in Phase I of the EDSP should be drawn from compartments that combine the use of exposure and effects information. The example further identified 10-15% to be drawn from compartments limited to the consideration of exposure information, 10-15% to be drawn from compartments limited to the consideration of effects information, and 8-10% to be drawn from the clearly defined compartments for the "specially targeted" chemicals. The ranges reflected an understanding that these weightings/priorities might shift depending on the actual number of chemicals that will be subjected to screening during Phase I. The lower the actual number, the lower the percentage drawn from the combined exposure and effects compartments, and the higher the percentage drawn from the exposure-only and effects-only compartments.

PSWG members in attendance verified the facilitators description of how the concept of a compartment-based approach to priority setting arose. Several went on to explain that the PSWG envisioned any further refinement to the concept of a compartment-based approach would grow

out of the use of a database tool that would bring together all of the various exposure- and effects-related information outlined in the EDSTAC report. They stated that it appears the EPA strawman proposal intends to define a set of compartments in order to determine what data will go into the database, rather than using the database as a tool to determine what are the right set of compartments. These participants re-emphasized the value of running test cases (referred to as "what if" analyses) through version 2 of the EDPSD as soon as it is available.

One participant felt the strawman was trying to combine a lot of unrelated information and to force it into a common formula in order to get an answer in one step, as opposed to the EDSTAC's stepwise process where, for example, HTPS data would be used to "modify" other compartments. These modified compartments would combine exposure and effects data.

Another participant suggested that EPA might want to consider including a "zero effects" category for those chemicals that go through HTPS and nothing is picked up. Several EDSTAC members pointed out that the EDSTAC reports makes it clear that because of the inherent limitations of the data that will be generated from the HTPS assays, these data should not be used as a basis for eliminating a chemical from consideration for screening. In others words, the Report makes in clear that the HTPS data should be used in combination with other exposure and effects data, not in isolation.

Another participant asked if EPA intends to put chemicals through T1S because of their potential to cause reproductive/developmental effects or because they have the chance to impact the EAT pathways? EPA responded that it was the latter rather than the former, with the exception that if a chemical does show reproductive/developmental effects it should also be candidate for T1S, if not T2T or hazard assessment depending on the nature of the data. The participant went on to add that it will be important to characterize the different levels of "certainty" that are used as the basis for priority setting decisions. In other words, this participant felt it will be helpful to be as clear as possible about what percentage of chemicals are from under the lamp post (because you are confident of the information) and what percent are not from under the lamp post (because there is uncertainty regarding either the exposure or effects information).

The facilitator presented an overhead graph (see next page) in an effort to try to both capture the points that had been made, and to focus the groups discussions along these lines.

In explaining the chart, the facilitator pointed out the following features:

1. Consistent with the EDSTAC Report, the chart tries to distinguish between the types of exposure and effects information that will be useful for making priority setting decisions, and the application of this information into priority- setting "compartments." Thus, the two rows on the top of the diagram that show exposure and effects information would be applied to come up with the compartments which are depicted in the third row of the diagram.

Exposure Data

Relatively More Certain ←----- (Closest to "True" Exposure)		----------	----------→	Relatively Less Certain (Surrogate for Exposure)
Human Biological Sampling Data	Ecological Biological Sampling Data	Environmental Media	Environmental Releases (Toxic Release Inventory TRI)	Production & Import Volume
		Human / Ecological		

Environmental Fate and Transport Factors (to be applied to Env. Release and Prod./Imp. Vol.)

Effects Data

Relatively More Certain (Closest to a "True" Effect) ←-------		----------	----------→	Relatively Less Certain (Model Possible Effect)
Human Epidemiology Studies	Ecological Field Studies	Lab Studies	HTPS	Models
		Human / Ecological	Estro. / Andro. / Thy.?	QSAR / Chemo. / Phar-mo

Priority Setting Compartments Compartments for Phase I Screening

60-72% (?)				10-15% (?)		10-15% (?)	8-10% (?)		
Combined Exposure & Effects				Exposure Only		Effects Only	Specially Targeted Chemicals		
							Nom.	NONEs	Mix.

2. The exposure and effects rows are arrayed such that the information thought to be closest to either a "true" exposure or effect is listed on the left side, while information further removed from (but can serve as a surrogate for) "true" exposure, or a model of possible effects, is listed on the right.

3. The row that shows the possible compartments is also arrayed in a manner that shows the most heavily weighted compartments, which are those that rely on a combination of exposure and effects data, being on the left, with the exposure-only and effects-only compartments following, and these followed by the specially targeted chemicals. The percentages ranges used in the diagram were those used in the example set forth in the EDSTAC Report.

Percentages Among the Categories:

The diagram spurred the group to discuss the percentages for each of the four categories. Many participants acknowledged the percentages eventually chosen will depend upon the number of chemicals to be screened in any particular phase. In essence, if the total number of chemicals to be included is large, then that means there will have to be more reliance on environmental release and production and import data because these data exist for a much larger number of chemicals than is true for the many other types of exposure and effects information categories. This will force the priority- setting system to use exposure information that is more uncertain. This reinforced the desire of some participants to use the environmental fate and transport factors to screen these "surrogate" measures of exposure.

Alternatively, it was suggested, the fewer number of chemicals screened during Phase I, the more heavily the priority- setting process should rely upon effects data in order to determine whether the chemicals that have at least some indication of an effect really do have an effect.

Finally, in order to address the lamp post problem, many participants felt that, regardless of the number of chemicals ultimately subjected to screening during Phase I, some percentage, probably higher than the 10-15% figure in the EDSTAC example, should be screened for reasons related solely to exposure considerations. Similarly, some percentage, once again, probably higher than the 10-15% figure in the EDSTAC example, should be screened for reasons related solely to effects considerations.

Some participants indicated EPA might be better served if they were more concerned about the exposure only category because it could be used to give high priority to sensitive/highly impacted populations. Others indicated that increasing both of the "only" categories would probably be more useful. Some, however, suggested the percentages laid out by EDSTAC were fine for Phase I, but the question of how to make sure the highest priority ones are in Phase I needs to be addressed.

Some participants questioned why they should even be discussing relative rankings if, because of resource limitations, the program is only dealing with small numbers going through. EPA staff recognized the difficulties inherent in a "theoretical" discussion, but added that the discussions

that are taking place at this workshop are nevertheless quite helpful, regardless of what the actual number will be.

A couple of participants felt the idea of looking across a spectrum of certainty related to the exposure and effects information available was intriguing. They stated that a large amount of effects information exists for a few chemicals. They felt this program should not be designed to obtain even more information on those relatively few "data-rich" chemicals. This feature, being suggested to provide an assessment of the degree of certainty of the system, would provide the Agency with an opportunity to determine on which side of the exposure/effects equation they wish to focus. It was suggested that the priority setting system should be about creating the information base that provides people with the opportunity to make clear decisions about which chemicals you want to test because there is high quality information, as well as those you want to include because you feel there is the potential high risk, even though you do not have high quality information to assess that risk. They pointed out that the screening and testing program is itself designed to fill in those data gaps.

While some had indicated concern regarding only looking under the lamp post and choosing primarily chemicals with lots of existing information, EPA staff reminded the group that the priority setting is taking place after the "sorting" phase of the program so those chemicals which are known endocrine disruptors (e.g., DDT) will already have moved into the EDSP.

Because of the paucity of effects data, the "effects only" category was thought by some to essentially be those chemicals that receive a high ranking as a result of the HTPS assays or from models, while the "exposure and effects" category includes those chemicals being driven by compartments in both categories. To help clarify the true intent of the different categories, it was suggested the word "only" be replaced with effects or exposure "driven."

A specific concern was raised with respect to whether the "generally recognized as safe" (GRAS) substances, supplements, etc. were thought to make the 10,000 pound production criteria and therefore be included in HTPS or not. EPA staff indicated it was doubtful, and added they are not in the TSCA inventory either.

Revisiting Questions Asked in Initial Presentations

During the EPA presentations on the first day, and in the original Federal Register notice, a number of questions were put before the Workshop participants. Near the end of the second day the group reviewed these questions and determined which ones they felt they had addressed and which ones might benefit from additional comments. For the most part, the group felt their conversations had touched on most of the questions, but they wanted to add a few thoughts to a couple of them.

Question 5: Do the exposure compartments allow for adequate consideration of disproportionately exposed and susceptible populations?

While this question had been raised in the deliberations, some felt EPA needed to give it more thought in the next version of the strawman priority-setting process. In particular, considerations

about worker sub-populations should be clearly addressed. Someone suggested EPA ought to identify sub-populations that are exposed to certain chemicals and include them under the special category (e.g., dry-cleaners, pacifiers, shoe-repair shops, manicurists).

Another suggestion related to using a common metric of dose, percentage of people exposed, and specific pathways of exposure as "denominators" that might be applicable in efforts to address disproportionately exposed and susceptible populations.

Question 7: How should chemicals that occur in multiple compartments be treated (i.e., should the ranking system somehow take into account frequency of occurrence across all compartments)?

The group also felt this question had not been answered, at least in terms of a chemical that shows up in a number of the compartments/information sources and still does not make it into the screening program because it is not have a "high ranking" in any one of them. One participant posited that if a particular chemical is in various compartments it adds to its own "weight of evidence" and could become a higher priority based upon weights you give to the various compartments. Exactly how to ensure these chemicals are adequately considered was not resolved, however some suggested adding up all the scores and looking at the highest total scores across compartments.

Public Comment

Stanley Scarano, President for the National Coalition for the Chemically Injured (NCCI), made a few comments at the end of the meeting's second day. He began by saying he was impressed with the use of good science in the priority- setting process thus far and thanked the workshop participants, EDSTAC, and EPA for those efforts. He added that, while the EPA and the workshop participants have a scientific interest in endocrine disruption, he and the other members of the NCCI have a personal interest. Endocrine disruption is only one of the problems faced by the NCCI members, and they view themselves as the legacy of, if not the children of, *Silent Spring*. In her book, Rachel Carson documented birth defects and other endocrine disruptor effects that were known even at that time. In closing, he indicated he was glad the workshop participants and EPA are the ones here addressing these difficult issues.

Closing and Adjourn

EPA thanked the workshop participants and members of the public who had attended. In addition, they indicated they would appreciate written comments on how they might want to approach any of the questions but especially how they should use environmental fate parameters to help rank chemicals in other compartments.

Attachments:

A – Workshop Participant List
B – EPA Strawman Proposal
C – Jim Darr Presentation Overheads
D – Pat Kennedy Presentation Overheads
E – Stanley Milstein Presentation Overhead

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